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Original Study

Lessons Learned From Root Cause Analyses of Transfers of Skilled Nursing Facility (SNF) Patients to Acute Hospitals: Transfers Rated as Preventable Versus Nonpreventable by SNF Staff

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A B S T R A C T

Background: Determining if a transfer of a skilled nursing facility (SNF) patient/resident to an acute hospital is potentially avoidable or preventable is challenging. Most previous research on potentially avoidable or preventable hospitalizations is based on diagnoses without in-depth root cause analysis (RCA), and few studies have examined SNF staff perspective on preventability of transfers.
Objectives: To examine factors associated with hospital transfers rated as potentially preventable versus nonpreventable by SNF staff.
Design: Trained staff from SNFs enrolled in a randomized controlled clinical trial of the INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement program performed retrospective RCAs on hospital transfers during a 12-month implementation period.
Setting: SNFs from across the United States.
Participants: Sixty-four of 88 SNFs randomized to the intervention group submitted RCAs with a rating of whether the transfer was determined to be potentially preventable or nonpreventable.
Interventions: SNFs were implementing the INTERACT Quality Improvement (QI) program.
Measures: Data were abstracted from the INTERACT QI tool, a structured, retrospective RCA on hospital transfers.
Results: A total of 4527 RCAs with a rating of preventability were submitted during the 12-month implementation period, of which 1044 (23%) were rated as potentially preventable by SNF staff. In unadjusted univariate analyses, factors associated with ratings of potentially preventable included acute changes in condition of fever, decreased food or fluid intake, functional decline, shortness of breath, and new urinary incontinence; other factors included the clinician, resident, and/or family insisting on the transfer, transfers that occurred fewer than 30 days from SNF admission and that occurred on weekends, transfers ordered by a covering physician (as opposed to the primary physician), and transfers that resulted in an emergency department (ED) visit with return to the SNF. Factors associated with ratings of nonpreventable included on-site evaluation by a physician or other clinician, and transfers related to falls. Among factors precipitating the transfers, clinician and resident and/or family insistence on transfer, and transfers related to fever and falls remained significant in a multivariate analysis. There were no significant differences among characteristics of SNFs that rated a relatively high versus low proportion of transfers as potentially preventable.
Conclusion: SNF staff rated a substantial proportion of transfers as potentially preventable on retrospective RCAs. Factors associated with ratings of preventability, as well as illustrative case examples,

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provide important insights that can assist SNFs in focusing education and care process improvements in order to reduce unnecessary hospital transfers and their associated morbidity and costs.

Reducing potentially avoidable or preventable hospitalizations (PPH) is increasingly important to skilled nursing facilities (SNFs) and hospitals as Medicare reimbursement continues to shift from fee-for-service to strategies that value quality over quantity of care.[1,2] Increasing enrollment in Medicare managed care plans, bundled payments, and accountable care organizations are all examples of reimbursement strategies that have strong financial incentives to reduce PPHs. In addition, hospitals are being financially penalized for high 30-day readmission rates and for 30-day readmissions after hospitalizations for specific diagnoses. A new 30-day readmission quality measure for SNFs will take effect in 2017. Thus, understanding factors associated with PPHs is critical to effectively reduce PPHs in a feasible and safe manner.

Estimates of the proportion of hospitalizations of SNF patients that are potentially preventable vary considerably depending on how "preventable" or "avoidable" is defined.[3–14] Studies in which expert panels have reviewed SNF and hospital records have rated 45% to 68% of hospitalizations as potentially avoidable.[5,6] Other studies using large administrative databases that defined PPHs based on a list of diagnoses have found that 23% to 39% of hospitalizations from SNFs are associated with an ambulatory care sensitive diagnosis or a condition that can often be managed outside of a hospital.[7–10] These latter studies are limited because they do not account for many factors that can contribute to decisions to transfer and admit to the hospital.[11–14] For example, not all hospitalizations for diagnoses such as congestive heart failure and pneumonia are avoidable, dependent on the severity of the patient's condition, patient and family preferences, and several other factors.[8] Data from root cause analyses (RCAs) of close to 6000 hospital transfers selected for review by SNF staff during implementation of the INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement program indicate that in retrospect, SNF staff considered approximately 23% of transfers potentially avoidable or preventable.[11,12] The purpose of this article was to provide a more detailed examination of hospital transfers by RCA performed by SNF staff than previously reported[5,6,11,12] so as to identify clinical and other factors that might or might not be associated with PPHs. These data will further inform efforts to reduce these hospitalizations and their associated complications and costs.

Methods

Data presented herein are based on secondary analyses of data from a randomized controlled trial of implementing the INTERACT Quality Improvement (QI) program involving 264 SNFs from across the United States. Details of the eligibility, recruitment, characteristics of the participating SNFs, and an overview of the RCA data can be found in a recent publication.[12] SNFs randomized to the immediate intervention group were provided training in completion of the INTERACT QI tool, a structured, retrospective RCA of hospital transfers designed to be performed by SNF staff.[15,16] The tool consists of checkboxes with specific items to facilitate summarizing the data, as well as spaces for narrative text. The tool asks a yes/no question at the end of the structured review that was used as the basis for determining preventability of hospital transfer: "In retrospect, does your team think this transfer might have been prevented?"

Participating SNFs were asked to perform RCAs on as many hospital transfers as they could and submit a minimum of 4 QI tools per week (assuming they had this many transfers). Trained facility-based staff who were serving as champions and co-champions for the project completed the QI tools, which were copied, de-identified, and mailed to the project team at intervals of 3 to 4 months. Trained research assistants entered the QI tool data into a Microsoft Excel database (Microsoft, Redmond, WA).

Differences between transfers rated as potentially preventable versus not preventable in relation to presenting signs and symptoms, diagnostic testing, medical evaluation, interventions before transfer, and other factors were examined by a series of χ^2 tests. Factors identified as significant at the .05 level (without adjustment for multiple comparisons) were entered into a multivariate logistic regression analysis to determine which factors remained significant related to ratings of preventability. To examine differences in the characteristics of SNFs that rated a high versus low proportion of transfers as preventable, a "high" proportion of preventable transfers was considered those in the top quartile (rating more than 35% of transfers as potentially preventable) and a "low" proportion of preventable transfers those in the bottom quartile (rating less than 10% of transfers as potentially preventable). SNFs that did not send an average of at least 1 RCA per month were excluded in this analysis so as not to skew the data.

Results

During the 12-month implementation period, 4856 QI tools were received from 64 of the 71 SNFs that were actively participating in the immediate implementation group. The mean and median number of QI tools submitted were 76 and 49, respectively, with an interquartile range of 30 to 106. Characteristics of these SNFs were reported in a previous article.[12] Among the QI tools submitted, 4527 (93%) had a completed section on preventability of the transfer, 1044 were rated as potentially preventable (23%), and 3483 (77%) were rated as not preventable.

Table 1 illustrates the univariate association of various reasons for the transfers to ratings of preventability, including presenting signs and symptoms, diagnostic test results done to evaluate the change in condition, and other commonly identified factors. Among all the signs and symptoms listed on the QI tool as a change in condition related to the transfer, fever, decreased food and fluid intake, functional decline, and shortness of breath were significantly associated with a rating of a potentially preventable transfer in univariate analyses, whereas a fall was significantly associated with a rating of not preventable. Leukocytosis and abnormal pulse oximetry were the only 2 abnormal test results significantly associated with a rating of a potentially preventable transfer. Transfers that were related to a clinician's decision and/or patient/resident and/or family insistence on transfer were also significantly associated with a rating of a potentially preventable transfer, whereas an advance directive not being in place was not associated with a preventable rating.

Table 2 illustrates the association of characteristics of the transfers to ratings of preventability, including when the transfer occurred, evaluation of the change of condition that was done before the transfer, interventions implemented before the transfer, which clinician ordered the transfer (the patient/resident's primary care clinician or a covering clinician), and the outcome of the transfer (emergency department [ED] visit only versus inpatient admission). The highest proportion of transfers occurred within 7 to 29 days and more than 90 days after SNF admission; a slightly

Table 1
Reasons for Transfer Among Transfers Rated as Potentially Preventable Versus Not Preventable

Reasons for Transfers,* n = 4527	Number (%) With Specified Reason for Transfer That Were Rated as Potentially Preventable	Number (%) With Specified Reason for Transfer That Were Rated as Not Preventable	P†
Signs and symptoms			
Abdominal pain	48 (24.4)	149 (75.6)	.660
Abnormal vital signs	365 (24.1)	1151 (75.9)	.256
Altered mental status	316 (24.7)	961 (75.3)	.094
Behavioral symptoms	171 (24.8)	518 (75.2)	.238
Bleeding	69 (19.1)	292 (80.9)	.063
Cardiac arrest	2 (50.0)	2 (50.0)	.201
Chest pain	32 (18.8)	138 (81.2)	.180
Diarrhea	16 (28.1)	41 (71.9)	.368
Edema	30 (24.4)	93 (75.6)	.725
Fall	59 (15.9)	312 (84.1)	**.001**
Fever	161 (28.5)	403 (71.5)	**.001**
Decreased food and/or fluid intake	153 (28.4)	385 (71.6)	**.002**
Functional decline	194 (26.4)	542 (73.6)	**.021**
Gastrostomy tube blockage/displacement	15 (20.3)	59 (79.7)	.564
Loss of consciousness	21 (23.6)	68 (76.4)	.906
Nausea/vomiting	78 (23.6)	252 (76.4)	.801
Pain (uncontrolled)	196 (22.8)	662 (77.2)	.859
Respiratory arrest	12 (34.3)	23 (65.7)	.114
Respiratory infection	64 (28.1)	164 (71.9)	.066
Seizure	8 (16.3)	41 (83.7)	.260
Shortness of breath	282 (26.1)	798 (73.9)	**.007**
Skin wound/pressure ulcer	75 (19.5)	310 (80.5)	.080
Unresponsiveness	109 (22.9)	366 (77.1)	.945
Urinary incontinence (new)	50 (30.9)	112 (69.1)	**.017**
Weight loss	4 (33.3)	8 (66.7)	.398
Abnormal test results			
Anemia	94 (23.7)	303 (76.3)	.765
Electrocardiogram	8 (18.6)	35 (81.4)	.485
Hypoglycemia	17 (25.0)	51 (75.0)	.704
Hyperglycemia	39 (23.5)	127 (76.5)	.896
International Normalized Ratio: high	5 (23.8)	16 (76.2)	.936
Kidney function abnormal	56 (27.9)	145 (72.1)	.099
Leukocytosis	23 (35.4)	42 (64.6)	**.018**
Pulse oximetry	196 (26.1)	556 (73.9)	**.033**
X-ray	67 (22.6)	229 (77.4)	.853
Other factors			
Primary care clinician decision	639 (26.9)	1735 (73.1)	**<.0001**
Resident and/or family insisted on transfer	233 (33.0)	473 (67.0)	**<.0001**
Advance directive not in place	79 (25.5)	231 (74.5)	.297
Resources to care for change in condition not available in the SNF	2 (25.0)	6 (75.0)	.897

*Reasons were listed on the INTERACT QI tool. More than one reason for transfer was reported in most cases.
†*P* values calculated by χ^2 tests. Values are highlighted that reached significance at the .05 level (without adjustment for multiple comparisons; see text).

higher proportion of transfers rated as potentially preventable occurred between 7 and 29 days than transfers rated as not preventable; the reverse was found for transfers that occurred between 30 and 59 days and 90 days and longer. There was no significant association between time of day and rating of preventability, but a higher proportion of transfers that occurred on weekends were rated as preventable (26.6%) than not preventable (22.1%; $P = .003$). A slightly higher proportion of transfers rated as not preventable occurred after on-site medical evaluation (versus telephone evaluation) than among transfers rated as potentially preventable (23.5% vs 17.8%; $P < .001$). There was also a significant association of the rating of preventability with the clinician ordering the transfer. A slightly higher percentage of transfers rated as potentially preventable were ordered by a covering physician (as opposed to the primary care clinician) than among transfers rated as not preventable (13.7% vs 11.3%; $P = .04$).

In the analysis of the outcome of the transfer, data on both preventability and outcome (ED visit only with return to SNF versus inpatient admission) were available for 3910 transfers; 33 transfers that resulted in death in the ED before hospital admission were excluded from this analysis. Ratings of preventability among the 733 transfers that resulted in an ED visit with return to the SNF (18.7%) were compared with ratings of 3177 transfers that resulted in inpatient admission (81.3%). There was a significant association between outcome and rating of preventability ($P = .028$). Among the transfers that resulted in an ED visit with return to the SNF, 25.9% were rated as potentially preventable, whereas among transfers that resulted in inpatient admission, 22.1% were rated as potentially preventable. As illustrated in Table 2, viewed another way, among transfers rated as potentially preventable, 21.3% resulted in ED visit with return to the SNF, whereas among transfers rated as not preventable, 18.0% resulted in this outcome.

In a multivariate analysis that included factors that precipitated the transfer and that were significant in the univariate analyses, primary care clinician decision to transfer, resident or family member's insistence on transfer, patient/resident insistence on transfer, fall, and fever were associated with ratings of preventability ($P = .00$, $P = .00$, $P = .01$, and $P = .02$, respectively); new onset of urinary incontinence approached significance in this analysis ($P = .08$). Table 3 (See Supplementary data) includes examples of case scenarios abstracted from the RCAs that illustrate these findings.

Table 4 compares selected characteristics of SNFs that were in the bottom quartile of proportion of transfers rated as potentially preventable, versus SNFs that were in the top quartile of proportion of transfers rated as potentially preventable. There was no significant difference between these 2 groups of SNFs in any of the characteristics we examined.

Table 2
Characteristics of Transfers Rated as Potentially Preventable Versus Not Preventable

Characteristics*	Number (%) of Transfers Rated as Potentially Preventable With the Characteristic, n = 1044	Number (%) of Transfers Rated as Not Preventable With the Characteristic, n = 3483	P†
Days between SNF admission and transfer			
≤2	76 (7.5)	244 (7.3)	**.031**
3–6	119 (11.8)	365 (11.0)	
7–29	347 (34.4)	1010 (30.3)	
30–59	106 (10.5)	448 (13.5)	
60–89	65 (6.4)	193 (5.8)	
≥90	296 (29.3)	1068 (32.1)	
≤2	76 (14.0)	244 (15.1)	.552
3–29	466 (86.0)	1375 (84.9)	
<30	542 (53.7)	1619 (48.6)	**.005**
≥30	467 (46.3)	1709 (51.4)	
Time of day and day of week			
Morning	252 (27.3)	866 (28.5)	.852
Afternoon	400 (43.3)	1300 (42.7)	
Evening	171 (18.5)	536 (17.6)	
Night	100 (10.8)	339 (11.1)	
Morning or afternoon	652 (70.6)	2166 (71.2)	.730
Evening or night	271 (29.4)	875 (28.8)	
Weekday	760 (73.4)	2668 (77.9)	**.003**
Weekend	276 (26.6)	759 (22.1)	
Evaluation before transfer‡			
On-site (vs telephone) medical evaluation before transfer	186 (17.8)	817 (23.5)	**<.001**
Blood tests	174 (16.7)	508 (14.6)	
X-rays	109 (10.4)	318 (9.1)	.206
Urinalysis and/or culture	68 (6.5)	191 (5.5)	.211
Electrocardiogram	11 (1.1)	47 (1.3)	.445
Venous Doppler	9 (0.9)	25 (0.7)	.637
Other diagnostic tests	55 (5.3)	149 (4.3)	.177
Interventions before transfer‡			
New medication(s)	168 (16.1)	538 (15.4)	.620
Intravenous or subcutaneous fluids	42 (4.0)	127 (3.6)	.576
Increase oral fluid intake	6 (0.6)	12 (0.3)	.301
Oxygen	251 (24.0)	708 (20.3)	**.010**
Other intervention	116 (11.1)	301 (8.6)	**.016**
Clinician authorizing transfer			
Primary care physician (or nurse practitioner or physician assistant)	804 (86.3)	2737 (88.7)	**.040**
Covering physician	128 (13.7)	347 (11.3)	
Outcome of transfer§			
ED visit only with return to SNF	190 (21.3)	543 (18.0)	**.028**
Admitted as inpatient	702 (78.7)	2475 (82.0)	

*Data were missing for a small proportion of cases for some of the characteristics.
†*P* values calculated by χ^2 tests. Values are highlighted that reached significance at the .05 level (without adjustment for multiple comparisons; see text).
‡More than 1 characteristic could be reported for these items.
§This analysis excludes transfers that resulted in observation stays (n = 144) and deaths that occurred before the patient was admitted to the hospital (n = 33).

Discussion

The findings represent the most detailed data yet reported on factors that may be related to PPH from the perspective of SNF staff, based on RCAs of several thousand hospital transfers. They extend findings from a previous report, both in number of transfers analyzed and the depth of clinical and other data available from the INTERACT QI tool.[11] The factors that demonstrated the strongest association with ratings of preventability have important implications for education and care process improvements that may assist in efforts to reduce PPH.

The symptoms and signs most strongly associated with ratings of preventability were fall and fever. The associations of fever (and leukocytosis in the univariate analyses) with ratings of potentially preventable transfers are consistent with a recent report of ED visits in which infections were one of the most common ED diagnoses considered potentially avoidable.[10,17] Fever and leukocytosis are nonspecific findings, and in the absence of critical values can often be evaluated and managed in the SNF without transfer.[18] In contrast, falls were associated with a rating of not preventable by SNF staff. In the aforementioned study of ED visits, trauma, presumably related to falls, was the most common reason for transfers rated as potentially avoidable. SNF staff rating these transfers as not preventable is likely related to risk-averse behavior of SNF staff and clinicians based on concerns that serious injury may have occurred that is not clinically apparent. Fall management programs with careful documentation and follow-up protocols may assist SNFs in reducing transfers related to falls in which no serious injury is immediately apparent.[19–22]

Other symptoms that showed a trend toward significant association with ratings of potentially preventable transfers in the multivariate or univariate analyses included decreased fluid intake, functional decline, new onset of urinary incontinence, and shortness of breath. The first 3 of these are nonspecific symptoms and signs, and although they may be manifestations of a serious acute condition, they are often related to subacute decline that can be evaluated and managed without transfer to a hospital. Shortness of breath is a subjective symptom that is associated with multiple conditions that have been considered as potentially avoidable causes of hospitalization, including worsening congestive heart failure, chronic obstructive pulmonary disease, and pneumonia and/or asthma. Shortness of breath also may be related to anxiety, pain, or behavioral symptoms associated with dementia. Thus, objective evaluation of this symptom should be undertaken before transfer, including a careful determination of respiratory rate and pulse oximetry. In the absence of major

Table 4
Characteristics of SNFs With Low Versus High Proportion of Transfers Rated as Potentially Preventable

Characteristics	SNFs Rating a Low Proportion of Transfers as Potentially Preventable,* n = 14	SNFs Rating a High Proportion of Transfers as Potentially Preventable,* n = 15	P†
Total number of RCA tools submitted	103.5 (62.9)	83.8 (82.9)	.480
RCA tools submitted per licensed bed	0.76 (0.38)	0.60 (0.43)	.309
For-profit	7 (50%)	8 (53%)	.858
Part of a chain	5 (36%)	7 (47%)	.566
Rural	0 (0%)	2 (13%)	.482
Certified beds	132.8 (71.4)	156.6 (88.6)	.434
Occupancy rate	0.85 (0.17)	0.88 (0.10)	.546
Long-stay rate (>100 days)	0.65 (0.14)	0.66 (0.10)	.770
Average census of short-stay post-acute residents‡	18.0 (10.6)	19.9 (10.0)	.617
Nursing staffing ratios			
RN hours per resident day	0.88 (0.42)	0.76 (0.37)	.404
LPN hours per resident day	0.96 (0.48)	0.87 (0.32)	.588
RN + LPN + CNA hours per resident day	4.64 (1.18)	4.08 (0.76)	.147
Advance Directives§			
Living Will	35.6 (25%)	26.5 (31%)	.402
Durable Power of Attorney for health care	62.1 (46%)	56.4 (35%)	.715
POLST	7.4 (19%)	21.2 (38%)	.241
MOLST	13.4 (33%)	6.3 (25%)	.518
POST	0.6 (1%)	1.4 (5%)	.370
Hospice services available in SNF§	13 (100)	15 (100)	-
Overall quality rating score‖	3.93 (0.92)	3.47 (1.19)	.254

CNA, certified nursing assistant; LPN, licensed practical nurse; MOLST, Medical Orders for Life Sustaining Treatment; POLST, Physician Orders for Life Sustaining Treatment; POST, Physician Order Scope of Treatment; RN, registered nurse.

*Data are based on 56 of the 64 SNFs that submitted an average of at least 1 RCA tool per month for the 12-month intervention period. The 14 SNFs in the low quartile of these 56 homes rated less than 10% of transfers as potentially preventable; the 15 homes in the high quartile rated greater than 35% of transfers as potentially preventable.

†Calculated by χ^2 for categorical values and *t*-tests for continuous variables.

‡Average number of residents receiving Medicare reimbursement for skilled care reported by SNFs in the month before the intervention started.

§Average number of residents with advance directives and hospice service availability reported by SNFs in the month before the intervention started; data on 1 SNF in the low quartile for these variable was missing.

‖Based on the 5-star rating by the Centers for Medicare and Medicaid Services.

abnormal objective findings, consideration should be given to managing the condition without hospital transfer.

Two of the strongest associations with ratings of transfers as potentially preventable were the clinician making the transfer decision and the patient/resident or family insisting on the transfer. The intent of the RCA item on clinicians making the decision to transfer was to indicate a situation in which the nursing staff had evaluated the patient and was willing to manage the patient/resident without transfer but the clinician insisted on the transfer. Although this may not have been the case for some of these transfers, it has been commonly reported in implementing the INTERACT program. The propensity for clinicians to transfer is related to a number of factors, including a lack of understanding and support for the program, lack of confidence in the SNF staff evaluation, lack of financial incentives to manage the condition in the SNF, concerns about poor outcomes in the SNF or delays in hospital care, and/or concerns about legal liability. These factors may be especially important when evaluation takes place over the phone, and when transfer decisions are made by covering physicians (both associated with ratings of potentially preventable transfers in univariate analyses). Taken together, these findings highlight the need for more involvement of clinicians in efforts to reduce PPHs through education, improved communication that will result in greater mutual trust between clinicians and SNF staff, stronger medical director leadership, and aligned financial incentives for clinician efforts to reduce PPHs. AMDA is developing a new curriculum for clinicians practicing in the SNF setting that may be helpful in this regard. Involvement of nurse practitioners and teams of clinicians that spend a large part of their time in SNF practice have both been associated with lower rates of hospital admissions and 30-day readmissions.[23–26] Telemedicine also may help provide more widespread availability for “on-site” evaluations of acute changes in condition,[27] which has been proposed in new SNF regulations.[28]

Family and/or patient/resident insistence played an important role in the decision to transfer in 16% of the RCAs, and in more than one-quarter of the transfers rated as potentially preventable SNF staff recognized that earlier discussion of patient/family preferences and/or the presence of advance care plans and advance directives could have helped prevent the transfer.[12] Family and patient/resident preferences related to transfer are an important component of providing person-centered care in the SNF setting.[29,30] SNFs should develop trusting relationships with families, educate them on the capabilities of the SNF, have empathic discussions about person-centered goals of care, and use educational materials that are available from many sources.[16,31–36] These data also highlight the critical role of educating the SNF interdisciplinary team on advance care planning and person-centered care for preventing unnecessary hospitalizations, and the need to include complete and detailed information on advance directives and discussions related to them when transferring SNF patients to the hospital.

Trends in selected characteristics of the transfers in relation to ratings of preventability have implications for targeting RCAs and care process improvements. In univariate analyses, transfers rated as potentially preventable versus not preventable were more commonly associated with transfers that resulted in an ED visit and return to the SNF, transfers that occurred within 30 days of SNF admission, and transfers that occurred on weekends. Unplanned ED visits that resulted in return to the SNF had a relatively high chance of being considered avoidable or preventable, especially when vital signs are normal and no or minimal laboratory testing is done in the ED.[10,17] Such transfers should be a particular focus of SNF efforts to reduce unnecessary transfers. The same can be said about transfers that result in observation stays without inpatient admission, as the patient/resident did not meet inpatient criteria at the time of transfer. SNFs participating in this study could not consistently identify transfers that resulted in observation stays without admission, and the

relatively few transfers with this outcome in the RCAs submitted are not included in the analyses. Transfers that occur within a relatively short time period of SNF admission from the hospital may indicate problems with hospital-SNF communication and/or other care transitions problems that should be the focus of collaborative RCAs between SNF and hospital staff. Bolstering weekend coverage, including both licensed nursing staff and clinician involvement is a well-recognized need so as to reduce preventable hospital transfers, as well as to address other care quality issues.

Somewhat surprisingly, no differences were found between facilities that rated a relatively high versus low proportion of transfers as potentially preventable. It is likely that these differences are more dependent on factors that cannot be easily measured, such as the insights of the SNF staff who completed the RCAs, the involvement of the medical director and the interdisciplinary team in the RCAs, and collaboration with local hospitals that can yield insights into transfers that cannot be gleaned by SNF staff alone.

Several important limitations should be considered in interpreting these findings. As discussed in an earlier article, the sample of SNFs and transfers selected by SNF staff to review may be biased, limiting generalizability; and many factors that could influence ratings of preventability may not have been included on the INTERACT QI tool used for the RCAs. Moreover, many of the factors reported to be associated with ratings of preventability occurred in combination with each other, and it is difficult to determine what factor or factors play the most important role in the ratings. In addition, ratings of preventability are subject to the biases of individuals performing the RCAs, and despite efforts to train the champions in this project consistently, the interrater reliability of their ratings is not known, and is in the 60% to 70% range even when trained expert clinicians rate SNF, ED, and hospital records.[5]

The Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 offers a valuable opportunity to harmonize language and data items across hospital and post-acute care settings so as to improve communication and care quality. Items that might be helpful in determining preventability of transfers could be included in the data (such as vital signs at the time of transfer and other clinical assessment data), and consistent language and items will strengthen training efforts across settings. These strategies could in turn provide more reliable, valid, and robust assessments of the preventability of hospital transfers, and potentially many other quality measures. Improving such quality measures is absolutely critical to protecting vulnerable older patients in post-acute settings from the potential negative aspects of cost containment, especially as the Centers for Medicare and Medicaid Services continues to shift from fee-for-service to value-based Medicare payment models. Clinicians who work in post-acute settings should become aware of and become involved in efforts to improve quality measures for the patients and families they serve.

Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.jamda.2016.02.014.

References

1. Centers for Medicare and Medicaid Services. Welcome to the Partnership for Patients. Available at: https://partnershipforpatients.cms.gov/. Accessed November 4, 2015.
2. Ouslander JG, Berenson RA. Reducing unnecessary hospitalizations of nursing home residents. N Engl J Med 2011;365:1165–1167.
3. Ouslander JG, Maslow K. Geriatrics and the triple aim: Defining preventable hospitalizations in the long term care population. J Am Geriatr Soc 2012;60:2313–2318.
4. Ouslander JG, Diaz S, Hain D, Tappen R. Frequency and diagnoses associated with 7- and 30-day readmission of skilled nursing facility patients to a nonteaching community hospital. J Am Med Dir Assoc 2011;12:195–203.
5. Saliba D, Kington R, Buchanan J, et al. Appropriateness of the decision to transfer nursing facility residents to hospital. J Am Geriatr Soc 2000;48:154–163.
6. Ouslander JG, Lamb G, Perloe M, et al. Potentially avoidable hospitalizations of nursing home residents: Frequency, causes, and costs. J Am Geriatr Soc 2010;58:627–635.
7. Grabowski DC, O'Malley AJ, Barhydt NR. The costs and potential savings associated with nursing home hospitalizations. Health Aff (Millwood) 2007;26:1753–1761.
8. Walsh EG, Wiener JM, Haber S, et al. Potentially avoidable hospitalizations of dually eligible Medicare/Medicaid beneficiaries from nursing facility and home and community-based services waiver programs. J Am Geriatr Soc 2012;60:821–829.
9. Spector WD, Limcangco R, Williams C, et al. Potentially avoidable hospitalizations for elderly long-stay residents of nursing homes. Med Care 2013;51:673–681.
10. Burke RE, Rooks SP, Levy C, et al. Identifying preventable emergency department visits by nursing home residents in the United States. J Am Med Dir Assoc 2015;16:395–399.
11. Lamb G, Tappen R, Diaz S, et al. Avoidability of hospital transfers of nursing home residents: Perspectives of frontline staff. J Am Geriatr Soc 2011;59:1665–1672.
12. Ouslander JG, Naharci I, Engstrom G, et al. Root cause analyses of transfers of skilled nursing facility patients to acute hospitals: Lessons learned for reducing unnecessary hospitalizations. J Am Med Dir Assn 2016;17:256–262.
13. Buchanan J, Murkofsly RL, O'Malley AJ, et al. Nursing home capabilities and decisions to hospitalize: A survey of medical directors and directors of nursing. J Am Geriatr Soc 2006;54:458–465.
14. Dwyer R, Stoelwinder J, Gabbe B, et al. Unplanned transfer to emergency departments for frail elderly residents of aged care facilities: A review of patient and organizational factors. J Am Med Dir Assoc 2015;16:551–562.
15. Ouslander JG, Bonner A, Herndon L, Shutes J. The INTERACT Quality Improvement Program: An overview for medical directors and primary care clinicians in long-term care. J Am Med Dir Assoc 2014;15:162–170.
16. INTERACT. Interactions to Reduce Acute Care Transfers. https://interact.fau.edu. Accessed February 11, 2016.
17. Ouslander JG, Schnelle JF, Han J. Is this really an emergency? Reducing potentially preventable emergency department visits among nursing home residents. J Am Med Dir Assoc 2015;16:354–357.
18. High KP, Bradley SF, Gravenstein S, et al. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Disease Society of America. Clin Infect Dis 2009;48:149–171.
19. Choi M, Hector M. Effectiveness of intervention programs in preventing falls: A systematic review of recent 10 years and meta-analysis. J Am Med Dir Assoc 2012;13:188.e13–188.e21.
20. American Medical Directors Association. Falls and Fall Risk Clinical Practice Guideline. Columbia, MD: AMDA; 2011.
21. Panel on Prevention of Falls in Older Persons, American Geriatrics Society and British Geriatrics Society. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older People. J Am Geriatr Soc 2011;59:148–157.
22. Jo A Taylor Consulting. Available at: http://joataylor.com/resources. Accessed February 11, 2016.
23. Reuben D, Buchanan J, Farley D, et al. Primary care of long-stay nursing home residents: A comparison of 3 HMO programs with fee-for-service care. J Am Geriatr Soc 1999;47:131–138.
24. Konetzka RT, Spector W, Limcangco MR. Reducing hospitalizations from LTC settings. Med Care Res Rev 2008;65:40–66.
25. Bakerjian D. Care of nursing home residents by advance practice nurses: A review of the literature. Res Gerontol Nurs 2008;1:177–185.
26. Kuo YF, Raji MA, Goodwin JS. Association between proportion of provider clinical effort in nursing homes and potentially avoidable hospitalizations and medical costs of nursing home residents. J Am Geriatr Soc 2013;61:1750–1757.
27. Grabowski DC, O'Malley AJ. Use of telemedicine can reduce hospitalizations of nursing home residents and generate savings for Medicare. Health Aff (Millwood) 2014;33:244–250.
28. Katz PR, Resnick B, Ouslander JG. Requiring on-site evaluation in the nursing home before hospital transfer: Is this proposed CMS rule safe and feasible? J Am Med Dir Assoc 2015;16:801–803.
29. Molloy DW, Guyatt GH, Russo R, et al. Systematic implementation of an advance directive program in nursing homes: A randomized controlled trial. JAMA 2000;283:1437–1444.
30. Mitchell SL, Teno JM, Intrator O, et al. Decisions to forgo hospitalization in advanced dementia: A nationwide study. J Am Geriatr Soc 2007;55:432–438.
31. Tulsky JA. Beyond advance directives: Importance of communication skills at the end of life. JAMA 2005;294:359–365.
32. National Hospice and Palliative Care Organization. Available at: http://www.nhpco.org/. Accessed November 4, 2015.
33. Coalition of Compassionate Care of California. Available at: http://coalitionccc.org/. Accessed November 4, 2015.
34. Physicial Orders for LifeSustaining Treatment Paradigm. POLST. Available at: http://www.polst.org/. Accessed November 4, 2015.
35. The Conversation Project. Available at: http://theconversationproject.org/. Accessed November 4, 2015.
36. Decision Guide. Available at: http://www.decisionguide.org/. Accessed November 15, 2015.